

# **TYPHOON GENE (21W)**

## **I. HIGHLIGHTS**

Gene was the fifth significant tropical cyclone to form in September and the fifteenth of the year to reach typhoon intensity. The initial disturbance formed 250 nm (465 km) west-southwest of Guam and tracked westward for three days before turning northwestward. Gene followed a classic recurvature pattern, passing west of Okinawa and skirting southern Japan. The orientation of Gene's recurvature track resulted in sustained radar contact from 251400Z to 300400Z and an excellent, high quality set of 250 position reports from land radar sites in the islands nearby.

## **II. CHRONOLOGY OF EVENTS**

- 180600Z - First mentioned on Significant Tropical Weather Advisory as an area of persistent convection with an estimated minimum sea-level pressure of 1008 mb.
- 230600Z - First Tropical Cyclone Formation Alert issued in response to increased organization induced by TUTT cell to the west.
- 231200Z - First warning prompted by a Dvorak current intensity estimate of 2.0 and an increase in total convection.
- 240600Z - Upgrade to tropical storm based on improved organization and enhanced outflow.
- 251800Z - Upgrade to typhoon based on a CI 4.0.
- 271200Z - Peak intensity of 80 kt (40 m/sec) maintained until 290600Z.
- 300600Z - Downgraded to tropical storm based on synoptic data.
- 301800Z - Final warning issued due to extratropical transition.

## **III. TRACK AND MOTION**

Gene followed a typical recurvature track. The tropical cyclone initially tracked along the equatorward side of the mid-level subtropical ridge, then turned northwestward to approach a break in the axis in the ridge. Recurvature occurred on 27 October 100 nm (185 km) west of Okinawa in conjunction with a passing short-wave trough. Now under the influence of stronger westerly winds aloft, Gene accelerated east-northeastward and changed into an extratropical low 300 nm (555 km) east of Tokyo.

## **IV. INTENSITY**

For five days Gene's winds remained less than 25 kt (13 m/sec). However, on 23 September, assisted by a TUTT cell to the west, normal intensification of one T-number per day started. Although the track followed the warm Kuroshio ocean current, restricted outflow aloft limited development. Nevertheless, after attaining peak intensity, Gene (Figure 3-21-1) maintained 80 kt (40 m/sec) for two and a half days before slowly weakening.

## **V. FORECASTING PERFORMANCE**

Figure 3-21-2, provides an overview of the forecasts. It illustrates two points: first, when NOGAPS prognoses are slow to weaken the mid-level subtropical ridge in response to the passing short-wave, JTWC's dynamic aids were slow (Figure 3-21-3); and second, if the initial forecast philosophy is for a "straight runner," there is a reluctance to shift to recurvature at the first indication of a change.

## **VI. IMPACT**

There were no reports of damage on Okinawa, but as Gene moved along the southern coastlines of the Kyushu and Honshu, it caused four deaths, 12 injuries, and localized flooding. Wind speeds of 70 kt (36 m/sec) were measured on Kyushu, but weakened to 38 kt (20 m/sec) as Gene brushed by Tokyo.

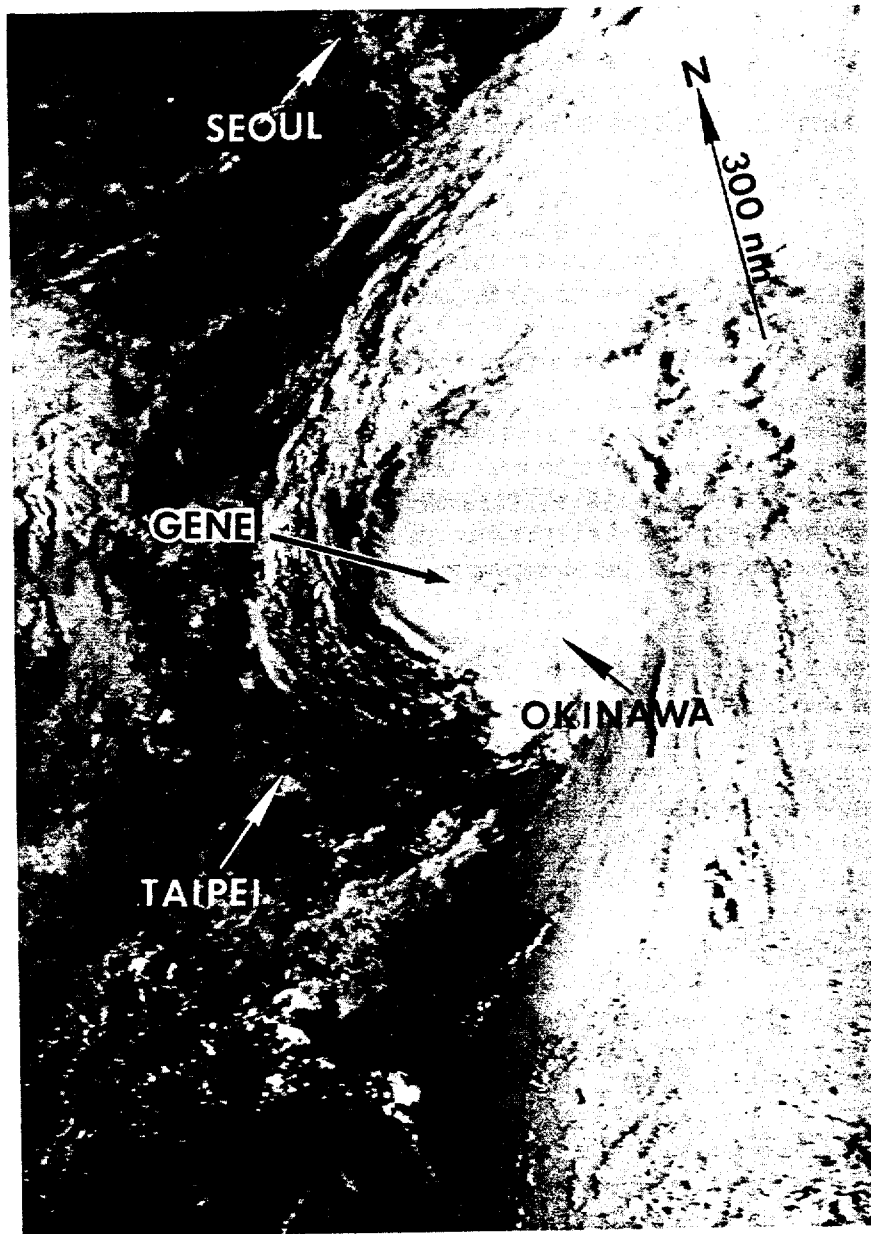


Figure 3-21-1. Gene at peak intensity (272346Z September NOAA visual imagery).

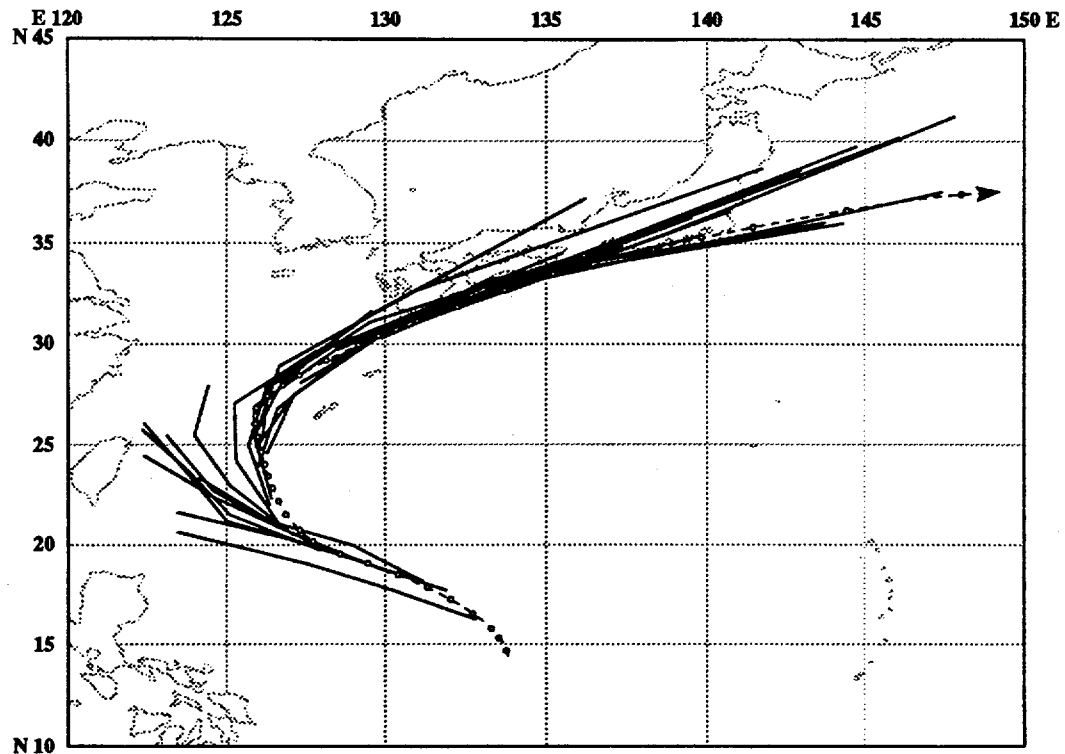


Figure 3-21-2. Summary of JTWC forecasts (solid lines) for Gene superimposed on the final best track (dashed line).

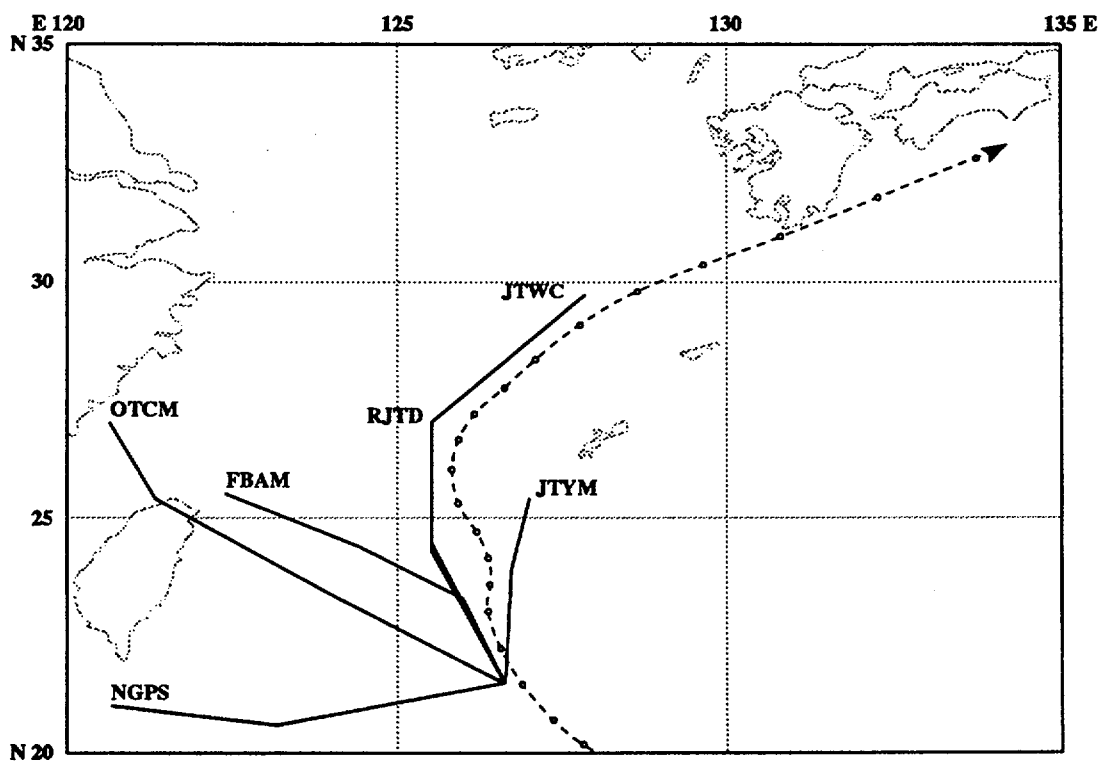


Figure 3-21-3. Comparison of 251200Z September forecasts by JTWC and supporting dynamic aids NGPS, FBAM and OTCM. Also shown are forecasts by the Japan Meteorological Agency (RJTD) and the Japanese Typhoon Model (JTYM).